SECTION 101 CLAIM REJECTIONS

3. In response to examiner's request for evidence of operability, applicant has submitted a video clip demonstrating a working invention.

4. Additionally, in reference to examiner's rejection based on violation of Newton's third law of motion, applicant submits articles which highlight exceptions to the law, and demonstrate working models based on such exceptions.

    A. Montalk. Action Without Equal and Opposite Reaction. [Online], [retrieved on 2004-09-22]. Retrieved from the Internet < URL: http://www.montalk.net/newton/newton2.html >.

    B. Eugene, David. The Gyroscopic Inertial Thruster. [Online], [retrieved on 2004-09-22]. Retrieved from the Internet < URL: http://www.open.org/~davidc/gitplain.htm >.

SECTION 112 CLAIM REJECTIONS

5. Because of the specific design of the device, the rotation of the weights produces a directional force, not a vibratory motion. The weights are of a variable radius type; the weights move toward and away from the axel in their orbit, achieving an unbalanced centrifugal force.

6. Claim 3 has been amended, as described above.

SECTION 103 CLAIM REJECTIONS

7. Examiner rejects claims 1-13 as being unpatentable over Ryan ('615). Ryan discloses a vibrating device. Applicant discloses a device that produces propulsive directional force, not merely vibrating action. In response to examiners request, applicant is submitting a video that shows a working model of the invention disclosed. The disclosure of a device that produces directional motion is patently distinguishable from a device that merely vibrates.

8. Examiner also rejects claims 1-13 as being unpatentable over McMahon ('163). McMahon discloses an apparatus for converting rotational movement into linear movement. The apparatus disclosed is needlessly complex, comprising multiple gears and drive means. The present invention achieves similar results with a minimal amount of components, thus resulting in a less costly and more efficient design. Nowlin ('248) is similarly complex, disclosing "a plurality of cranks pivotally connected, gear connections between said cranks ..."

MARKED UP SPECIFICATION

[024] ~~The present invention provides systems and methods to~~ A propulsion apparatus~~, and particularly to propulsion devices~~ using unbalanced centrifugal force to propel a vehicle in a unidirectional motion. According to one embodiment, a device for conversion of centrifugal force to linear force and motion is disclosed, comprising: a first gear rotatably fixed to a first arm and having a first connecting bar rotatably attached to and abutting the inner side of the first gear and a second connecting bar rotatably attached to and abutting the outer side of the first gear; a second gear in opposite rotational communication with the first gear and weighted along an outer edge and rotatably attached to and abutting the first connecting bar and the second connecting bar; and a ~~first~~ drive ~~means~~ for translating centrifugal motion of the first gear to unidirectional motion.

Respectfully submitted,

By: _____

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as express mail Label ER 805223718US in an envelope addressed to: MS Box Amendments No Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

on September 23, 2004 9/23/04

_____

Jennifer Meredith, ~~Reg. No. 47,790~~

MARKED UP CLAIMS

1. (Original) A device for conversion of centrifugal force to linear force and motion, said device comprising:

a first gear fixed to a first arm and having a first connecting bar rotatably attached to and abutting the inner side of said first gear and a second connecting bar rotatably attached to and abutting the outer side of said first gear;

a second gear in opposite rotational communication with said first gear and weighted along an outer edge and is rotatably attached to and abutting said first connecting bar and said second connecting bar; and

a first drive means for translating centrifugal motion of said first gear to unidirectional motion.

2. (Original) A device as in claim 1, further comprising:

a third gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and being rotatably attached to said first connecting bar and said second connecting bar one hundred and eighty (180) degrees from said second gear.

3. (Once Amended) A device as in claim 1, further comprising:

a third gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and being rotatably attached to said first connecting bar and said second connecting bar one hundred and eighty (180) degrees from said second gear;

a third connecting bar rotatably attached to said first gear;

a fourth gear in opposite rotational communication with said first gear, being ninety (90) degrees from said second gear and weighted along the outer edge, and being rotatably attached to said third connecting bar; and

a fifth gear in opposite rotational communication with said first gear, being 270 degrees from said second gear and weighted along the outer edge, and being rotatably attached to said third connecting bar~~; and~~

~~a third connecting bar rotatably attached to said first gear~~.

4. (Original) A device as in claim 3, further comprising:

a fourth connecting bar rotatably attached to said first gear said first connecting bar and abutting an outer side of said third connecting bar.

5. (Original) A device as in claim 1, wherein said first gear rotates in a clockwise direction and said second gear rotates in a counterclock wise direction.

6. (Original) A device as in claim 1, further comprising a second drive means for translating centrifugal motion of said first gear to unidirectional motion.

7. (Original) A device for conversion of centrifugal force to linear force and motion, said device comprising:

a first gear fixed to a first arm and having a first connecting bar rotatably attached to and abutting the inner side of said first gear;

a second gear in opposite rotational communication with said first gear and weighted along an outer edge and is rotatably attached to and abutting said first connecting bar; and

a first drive means for translating centrifugal motion of said first gear to unidirectional motion.

8. (Original) A device as in claim 7, further comprising:

a third gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and being rotatably attached to said first connecting bar one hundred and eighty (180) degrees from said second gear.

9. (Original) A device as in claim 7, further comprising:

a third gear in opposite rotational communication with said first gear and weighted along the outer edge and being rotatably attached to said first connecting bar one hundred and eighty (180) degrees from said second gear;

a fourth gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and is rotatably attached to said first connecting bar ninety (90) degrees from said second gear; and

a fifth gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and being rotatably attached to said first connecting bar two hundred and seventy (270) degrees from said second gear.

10. (Original) A device as in claim 7, wherein said first gear rotates in a clockwise direction and said second gear rotates in a counterclock wise direction.

11. (Original) A device for conversion of centrifugal force to linear force and motion, said device comprising:

a first gear fixed to a first arm and having a first connecting bar rotatably attached to and abutting the inner side of said first gear and a second connecting bar rotatably attached to and abutting the outer side of said first gear;

a second gear in opposite rotational communication with said first gear and weighted along an outer edge and is rotatably attached to and abutting said first connecting bar and said second connecting bar;

a third gear in opposite rotational communication with said first gear and weighted along the outer edge which rotates about said first gear and being rotatably attached to said first connecting bar and said second connecting bar one hundred and eighty (180) degrees from said second gear;

a fourth gear in opposite rotational communication with said first gear, being ninety (90) degrees from said second gear and weighted along the outer edge, and being rotatably attached to said third connecting bar;

a fifth gear in opposite rotational communication with said first gear, being two hundred and seventy (270) degrees from said second gear and weighted along the outer edge, and being rotatably attached to said third connecting bar;

a third connecting bar rotatably attached to said first gear, said fourth gear and said fifth gear; and

a first drive means for translating centrifugal motion of said first gear to unidirectional motion.

12. (Original) A device as in claim 11, wherein said first gear rotates in a clockwise direction and said second gear rotates in a counterclock wise direction.

13. (Original) A device as in claim 11, further comprising a second drive means for translating centrifugal motion of said first gear to unidirectional motion.

Action Without Equal and Opposite Reaction

montalk
3/31/04

"For every action, there is an equal and opposite reaction."
-Newton's Third Law of Motion

"Energy cannot be created or destroyed; it may be changed from one form to another."
-Law of Conservation of Energy

"The total momentum of an isolated system does not change."
- Law of Conservation of Momentum

The problem with these laws is not in their validity, but in their interpretation. There are exceptions to these interpretations which still obey the spirit of the law. A few will be discussed in this article.

The Law of Conservation of Momentum is commonly split into two separate laws, one dealing with linear momentum and another with angular.

In the linear case, the total linear momentum of an isolated system supposedly cannot change. In other words, it is impossible for to generate a forward momentum without an equal and opposite backward momentum. Stated another way, an isolated system cannot move forward without an external force acting upon it, or without exerting a force against its environment. Likewise, in the angular case it is said to be impossible for an isolated system to achieve rotation without the application of an external torque.

Thus, any device claimed to create action without reaction is denounced as a hoax because this would violate the conservation of linear or angular momentum.

However, it is possible to show that in hybrid systems whose reaction is part translational and part rotational, neither linear nor angular momentum can be conserved without violating the Law of Conservation of Energy. While total energy and momentum is conserved, linear and angular momentum individually are not conserved. The reasoning is as follows:

Possibility of Action Without Equal and Opposite Reaction

Conservation of Linear Momentum is valid for systems whose motion is entirely linear.

Conservation of Angular Momentum is valid for systems whose motion is entirely angular.

Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction.

These laws do not apply to systems whose total energy and momentum is divided between linear and angular components.

Conservation requires that initial quantity equals final quantity. If the final quantity is split

into two parts, then one part cannot equal the initial whole. In other words:

If A = B + C, and B is nonzero, then C cannot equal A.

If linear action (A) gives rise to both linear reaction (B) and angular reaction (C), then linear reaction (C) cannot equal the initial linear action (A). This contradicts the Law of Conservation of Linear Momentum.

Likewise, if the system is brought into motion via angular action, but its reaction is part linear and part angular, then angular reaction must be less than initial angular action. This contradicts the Conservation of Angular Momentum.

Constrained to linear motion, this isolated system will accelerate forward without an equal thrust backward, contradicting Newton's Third Law of Motion.

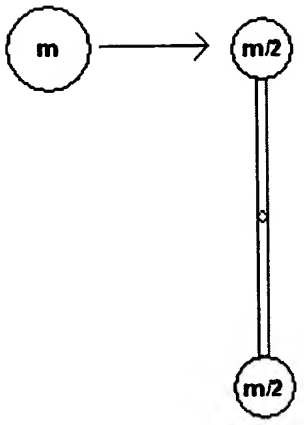
To force both angular and linear momentum be conserved, each part must equal the initial whole. Recombining the parts would give a quantity twice the original whole. Since energy is associated with momentum, this would create a violation in the Law of Conservation of Energy because final energy is greater than initial energy.

Because Conservation of Energy is a stronger law than any assumption involving conservation of linear or angular momentum, this case necessitates that action and reaction cannot be equal, thus contradicting the common interpretation of Newton's Third Law of Motion.

So contrary to assumption, the conservation of *linear* or *angular* momentum has exceptions and is therefore not a law. To repeat, while the *total* momentum of an isolated system remain constant (upholding the Law of Conservation of Momentum), it is not necessarily true that *linear* or *angular* momentum individually must be conserved. These specific conservation laws only apply in specific cases where there is no conversion between linear and angular momentum. Total linear momentum can decrease if kinetic energy is converted into rotational energy. Likewise, total angular momentum can decrease if rotational energy is converted into kinetic energy.

Demonstration of a Fallacy in "Newton's Law"

Consider the following hybrid system:



A point mass *m*, traveling at velocity *v*, is about to elastically collide with a barbell at right angles to its radius. The barbell consists of two point masses, each with mass *m*/2 separated by a weightless rigid rod. After the collision, the barbell spins about its axis, and the axis moves or translates to the right. Thus the barbell contains both angular and linear components of energy and momentum.

It will be shown that if linear and angular momentum are each assumed to be conserved in this collision, there will be a violation in the Law of Conservation of Energy. Likewise, if energy is to be conserved, then neither angular nor linear momentum can remain constant. Lastly, it will be shown that if linear momentum transforms into angular, then linear action cannot equal linear reaction. Thus, a device constrained to a frictionless track to isolate linear motion will move forward without applying an equal opposite reaction force, contrary to the assumed interpretation of Newton's Third Law.

Textbook Method of Analyzing A Hybrid System

We will analyze this system on the assumption that linear and angular momentum must each be conserved. This is done by separately analyzing the system's linear motion and angular motion.

1) First, an analysis of linear motion:

Let v_1 be velocity of the first mass, v_2 the transverse velocity of the barbell's center of mass. By assumption, linear momentum before collision must equal linear momentum after collision:

(1) $p = mv$, where "p" is linear momentum

(2) $p_1 + p_2 = p_1' + p_2'$

(3) $mv_1 + mv_2 = mv_1' + mv_2'$

(4) $v_1 = v_1' + v_2'$

Here, standard methodology invokes the Conservation of Energy, which states that energy before collision must equal energy after collision. This produces another equation which, together with (4), allows v_1' and v_2' to be determined:

(5) $T = 1/2\ mv^2$

T = kinetic energy

(6) $T_1 + T_2 = T_1' + T_2'$

(7) $1/2\ mv_1^2 + 1/2\ mv_2^2 = 1/2\ mv_1'^2 + 1/2\ mv_2'^2$

(8) $v_1^2 = v_1'^2 + v_2'^2$

Solving (4) and (8) reveals that (10) $v_1 = v_2'$. In other words, calculations show that the first mass stops moving upon impact and transfers its energy and momentum to the barbell, which as a whole then continues rightward at that same velocity. For now, this result appears consistent with energy and linear momentum conservation laws.

2) Second, an analysis of rotational motion.

By this assumption, angular momentum before collision must equal angular momentum after collision.:

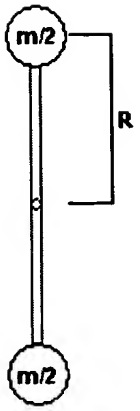
(11) $L = I\omega$

L is angular momentum
I is moment of inertia
ω is angular velocity.

(12) L1 + L2 = L1 + L2

(13) $I_1\omega_1 = I_1\omega'_1 + I_2\omega'_2$

Let R be the distance between the point mass and the barbell's center of mass (CofM).



Since the first mass collides at distance R, its moment of inertia is mR^2. The barbell's moment of inertia is also mR^2.

(14) $mR^2\omega_1 = mR^2\omega'_1 + mR^2\omega'_2$

(15) $\omega_1 = \omega'_1 + \omega'_2$

To determine ω_1 and ω_2, conventional physics once again calls upon the Conservation of Energy, whereby initial rotational energy must equal final rotational energy.

(16) $E = 1/2\ I\ \omega^2$

(17) $1/2\ mR^2\omega_1^2 = 1/2\ mR^2\omega'^2_1 + 1/2\ mR^2\omega'^2_2$

(18) $\omega_1^2 = \omega'^2_1 + \omega'^2_2$

Solving (18) with (15) shows that (19) $\omega'_2 = \omega_1$. Since $\omega_2' = v_R/R$, this shows that the tangential rotational velocity v_R of the barbell equals the initial velocity v_1 of the first mass. Once again, this seems to agree with the linear motion analysis whereby the first mass stops on collision, and the motion continues via the barbell.

So what we have so far are two results, the first analyzing linear motion, which shows that linear momentum and energy are conserved, and the second analyzing rotational motion and suggesting that angular momentum and energy are also conserved. This supposedly supports the idea that linear and angular momentum are indeed conserved, and that therefore the Law of Conservation of Linear Momentum (an interpretation of Newton's Laws) is upheld.

However, one calculation has been left out. To uphold the Law of Conservation of Energy, *total* initial energy must equal total *final* energy.

Correct Method of Analyzing a Hybrid System

During initial conditions, the barbell was stationary and the first mass moved at a certain velocity. Thus, all energy was initially stored in the first mass.

$$\text{Initial Energy} = 1/2\ mv_1^2$$

During final conditions, the first mass was stationary and the barbell moved, thus the final energy was stored entirely in the barbell. We know that the barbell is not only moving to the right at a constant transverse velocity v_2', but it is also spinning at the angular velocity ω'_2.

$$\text{Final Energy} = 1/2\ mv_2'^2 + 1/2\ I\omega_2'^2$$

Thus, the Conservation of Energy demands the following:

$$(20)\ 1/2\ mv_1^2 = 1/2\ mv_2'^2 + 1/2\ I\ \omega_2'^2$$

$$(21)\ 1/2\ mv_1^2\ -\ 1/2\ mv_2'^2 = 1/2\ (mR^2)\ (v_R/R)^2$$

According to the linear motion analysis, $v_1 = v_2'$. If true, then $\omega_2 = 0$. This is clearly false because we know that the barbell rotates. According to the angular motion analysis, $\omega'_2 = \omega_1$. If true, then $v_2' = 0$, which is also false because we know that the barbell moves as a whole to the right. And if we *force* these angular and linear momentum conservation laws to be true for the system, then there will instead be a violation in the Conservation of Energy.

These contradictions all stem from treating linear and rotational motion independently, which results in double-counting the energy of the first mass: once to balance the resulting kinetic energy of the barbell, and once to balance its rotational energy. As a whole, however, the energy equation does not balance. This can only mean that the initial energy must divide between resulting kinetic and rotational energy of the barbell.

To illustrate, energy and momentum are related like this:

$$T = p^2/2m \text{ and } E = L^2/2I$$

This means (20) can be expressed in terms of momentum.

$$(22)\ p_1^2/2m = p_2'^2/2m + L_2^2/2I_2$$

$$(23)\ p_1^2 = p_2'^2 + L_2^2/R^2$$

Equation (23) shows that upon collision, the initial linear momentum of the first mass splits up into angular and linear momentum of the barbell.

In essence, this obvious and simple equation proves that if the barbell rotates, then *the final momentum must be less than the initial momentum.* In other words, *action must be greater than reaction*, violating the common interpretation of Newton's Third Law.

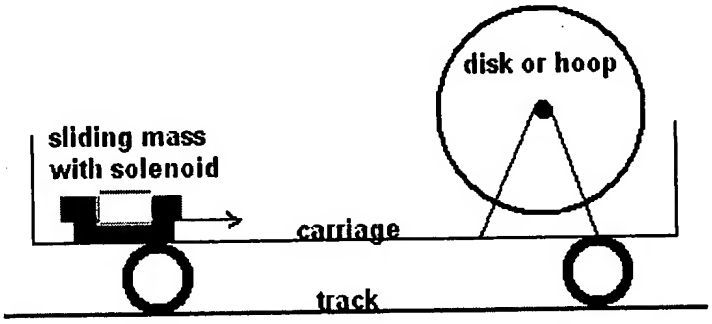
Thus, it is possible to build isolated systems that can move forward by themselves if their action is linear and reaction is partly angular. Let's call this the "Asymmetric Thrust Principle" or ATP. Such devices already exist, including David Cowlishaw's "Gyroscopic Inertial Thruster" and Roy Thornson's "Inertial Drive Engine".

However, mathematical analyses of these two devices are complex because they focus on complicated applications of the very simple principle detailed here in this article. Their mathematical complexity allows skeptics to dismiss any calculations indicating asymmetrical thrust as mere products of mathematical error. Nevertheless, equation (23) is simple enough to prove the point beyond debate.

For those wanting more rigorous proof, read "Proof of Action Without Equal and Opposite Reaction" - a more formal supplement to this article. This supplement shows step by step how to analyze a simple hybrid system and mathematically prooves not only that reaction is less than action, but gives the formula for determining this ratio for any mass set into rotation and translation by an elastic kinetic impact. Choose your version: HTML or PDF

Simple Application of the Aysmmetric Thrust Principle

As a thought experiment, let's take the mass-barbell system and rig it to form a device capable of moving without an external push. One example would be as follows:



A mass slides without friction along bottom of a carriage, with the carriage rolling on a track to allow only linear impulses to affect the overall motion of the system. The mass contains pistons or solenoids to allow it to kick off anything to its right or left. The wheel consists of a metal disk or hoop free to spin upon an axle mounted to a support. The support contains a braking mechanism to stop the disk from spinning at appropriate moments.

While this sounds complicated, examine the following diagram which traces one complete cycle of the device, showing how it picks up a net velocity without pushing off its environment.

CLICK HERE to open diagram in new window

You may notice several things. First, because part of the sliding mass's total momentum and energy is diverted toward spinning the wheel, not all goes toward opposing the initial velocity of the carriage. Thus, the mass can be returned to its original position on the carriage, without the carriage itself returning to its original position on the track.

If linear action and reaction were equal, then this system would simply slide back and forth on the track, ultimately going nowhere. Some devices utilizing the Asymmetric Thrust Principle are dismissed as simply scooting along a surface like an unbalanced washing machine, which requires that there be some friction. However, tests on pendulums, in water, and on low friction surfaces indicate that they move quicker than any slip-n-stick process could allow.

For example, take a look at David Cowlishaw's Gravitational Inertial Thruster, replicated successfully by Jean Naudin. Visit this link for Jean's report containing a video of the device in action. It moves both direction on a smooth glass surface, too quickly without heavy oscillation to have its motion be due entirely to slip-n-stick.

How does the GIT (Gravitational Inertial Thruster) work? A hollow ball races around a track designed to converts its linear/orbital momentum into spin angular momentum and vice versa so that the ball has greater velocity one one half of the track than the other. Centripetal force being asymmetrical, this generates a net thrust. The ball is hollow to distribute most of its mass around its periphery, maximizing its moment of inertia (rotational equivalent of mass) and minimizing its mass. Due to the Asymmetrical Thrust Principle where linear action and reaction are not equal, less momentum is transferred to the track to make the ball convert its angular spin into orbital speed than is gained by what momentum this additional orbital speed imparts upon the track. Due to this difference, there is a net impulse upon the system which makes it move on its own.

Conclusion

It should now be clear that total momentum and energy are always conserved, but their linear and angular components are not conserved in systems where one converts into the other.

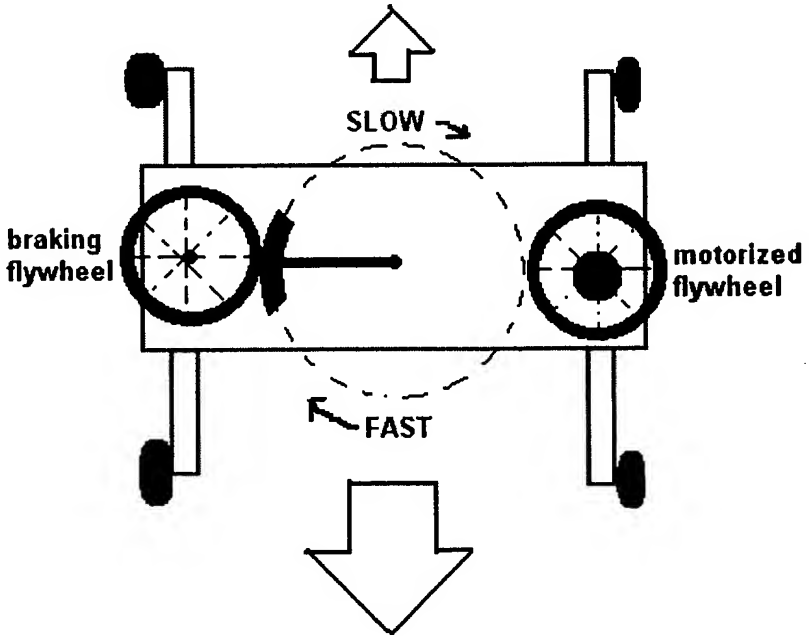
The textbook method for calculating this hybrid system makes the mistake of counting the initial energy twice, once for the linear analysis and once for the angular, giving a total energy greater than the initial and thus violating the Conservation of Energy law. The only way to correct this is to allow either linear or angular momentum to not necessarily be conserved, which then creates a situation where action and reaction aren't necessarily equal and opposite.

This error has not been discovered by science because it involves subtleties in handling frames of reference. The intellect sees everything as relative and cannot easily distinguish between absolute and relative differences between reference frames. It is prone to confusing gauge variant quantities with gauge invariant ones. When context is ignored, absolute differences appear arbitrary and thus nonexistent. This error shows up in many places, from Einstein's Equivalence Principle in relativity to the Lorentz and Coulomb gauge in electromagnetics.

In classical mechanics, this error leads to the rotational component of the hybrid system being treated as equivalent to the linear case, when in truth the two are different parts of a common whole. This logical fallacy is very subtle, but has placed unnecessary limits upon technology by creating consensual but false assumptions of what is possible.

Appendix I - other way to apply the Asymmetric Thrust Principle

Curved mass rotates freely around an axis. The motorized flywheel accelerates this mass for quick rotation around the bottom half, while the braking flywheel absorbs some of its momentum before letting it pass more slowly around the top half. The braking flywheel is frictioned so that it stops before the curved mass returns to it. The motorized flywheel is always spinning. Because the curved mass's tangential (orbital) velocity can be slowed or accelerated by the flywheel's angular momentum, action and reaction are not equal, thus ATP applies. Thus overall, this contraption should gain net velocity with each cycle.



return to www.montalk.net

THE GYROSCOPIC INERTIAL THRUSTER

GIT Plain Document.

RETURN to INDEX

This concept released 4 May 1997 in
Public release document gitworks.htm
by Inventor David Eugene Cowlishaw
davidc/gitplain.htm
Written 5 January 1998 - minor edit 19 April 1999
(removed larger Pipe GIT animation graphic link,
no longer available on site). Write me for a copy via email.

NOTE: A supplementary document has been written, further exploring this idea, more suited for those with a more extensive physics background.

GIT Theory explores the force pairing vectors that result in an exchange of angular acceleration through a partially angular, partially linear force profile, to result in an action reaction pairing between rotary force and linear force, breaking the "barrier" between the two!

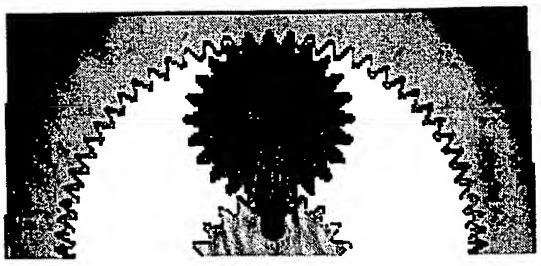
Please see GIT Theory Document written in May of 1998

What is inertial propulsion? It is the use of a device that does not react with it's environment in a mass exchange to produce thrust. That is, it doesn't use a jet of matter to push it forward, doesn't grab ahold of something to pull it forward (like a propeller for a plane or boat, or tires on pavement), and in general can be described as any thrust producing device that can be completely enclosed so that no direct matter interactions are possible, and placed free floating in space so vibrations do not propel it, yet still it goes!

Today the "traditional" science understanding makes inertial propulsion "impossible" and many have tried to accomplish this, to little success. Many have tried, indeed, many patents have issued on devices to "produce a unidirectional force", yet none are flying us to the stars yet!

The traditionalist will tell you that's because inertial propulsion is pure fantasy, and that Sir Isaac settled the question long ago, that in order to get something to move or change direction, it MUST be acted on by an outside force, therefore, no external matter interactions, no thrust, "inertial propulsion is impossible" and to short sighted science "authorities", I say HOGWASH! That's a violation of "Clarke's Law"! ;)

At the right is one form of my working inertial propulsion device, one that uses gearing to accomplish the needed spin translations. Why spin translations?



The traditionalist will tell you that "for every action, there is an opposite but equal reaction" and for linear

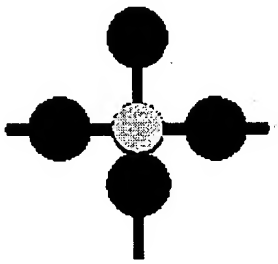
reactions (billiard ball mentality of simple collisions)
that is true! HOWEVER, equal is not always OPPOSITE when working with rotary systems and angular energy transfers!

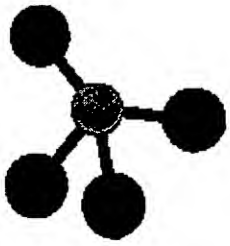
In a nutshell, the GIT works by momentarily unloading some of the reverse forces on the center of mass of our system into the centers of mass of the orbitals (moments of inertia), storing that energy long enough in the cycle to be released in the proper direction.

Let's review (there WILL be a TEST!). Other devices either don't work, or work so poorly that they will likely never leave the ground, and that's because before the GIT, all devices were mostly linear translations that operated around only ONE mass center, the system and attatchments you are using to try to generate thrust.

You can find a very good collection of previous attempts at Roger Cook's Spacedrives Archives, where he has one of the most complete collections of online patent covers for nearly every device that claims unidirectional force, mechanical, electrostatic, electromagnetic, et cetera, and is a good resource for anyone doing research in this area. Tell Roger, Dave said hi!

Previous mechanical devices to date have all used what I call "dumb weight" orbitals, most of them having mounted weights on arms that whirl around, and either are a variable radius type (the weights move toward and away from the axel in their orbit, trying to achieve an unbalanced centrifugal force, shown on the right), or the variable orbit velocity type, where each arm speeds up and slows down in it's journey around the axle, again attempting to generate an unbalanced centrifugal force (to little effect).





None to date before have used the spin of the orbitals to share the reverse forces and thus give a net unbalanced centrifugal force for propulsion. Linear thinking achieves linear results! I've been accused of thinking in circles, but for this device, it was the proper direction!

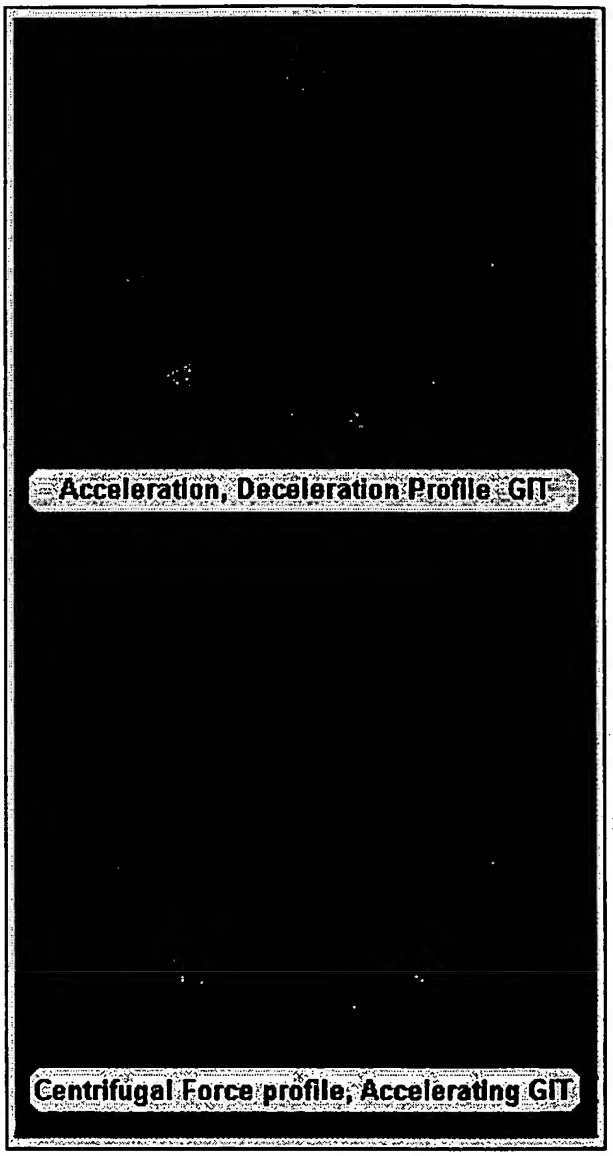
What most folks fail to take into account is the force needed to extend and retract the weights on the whirling arms in a variable radius type (with attendant coriolus forces), or the force needed to accelerate and decelerate the weights in a variable velocity type of system, and when the forces are summed, a net NADA (no, nope, none!) thrust is the result. It whirls, it shimmies, it rattles and shakes, but put it in a frictionless environment, it just makes vibrations without going anywhere!

Of the two, the variable radius type may actually show some thrust, since the closer the weights are to the axle, the greater it's spin (storing some reverse force), and thus the principle that allows my device to work may actually vindicate many variable radius thrusters. They are not near as powerful as my device though!

The GIT is a variable velocity type of thruster (this one works however!), in that the orbitals speed up and slow down about their orbit, and this gives us a split force system, the high speed side of the orbit gives us a greater centrifugal force at that end, while (in previous art) the energy needed to speed up and slow down the orbital weights generates what is refered to as tangential forces, two half circle thrust profiles that will balance or counteract the hoped for gains of the unbalanced centrifugal force.

At the lower right is a picture of what I'm talking about, note that the orbitals are grouped at the bottom, the low velocity side in this instance, and the lone orbital at the top is the one going flat out (in a circle of course) as our high velocity end at the top.

The orbit can be turning either direction, it doesn't matter once the orbitals are up to a constant average speed. The purple circle here is the contact path (top path superimposed on bottom path line) that forces the orbitals to convert their forward race velocity into spin, the very heart of this concept.



The two half circle arrow trains represent the acceleration and deceleration forces that the orbitals place on the race, and the unequal rays from the center of the lower half of the picture show the centrifugal force profile, very heavy to the front (the direction you're going toward, UP in this view!), and rather skinny on the backside.

In previous devices (the ones with the dumb weights that don't work so good) these two force profiles exactly cancelled each other over time, and No thrust was the result.

THIS IS WHERE WE BEGIN EXPLORING THE GIT

The moving bars animated gifs are just on this page to get you into the mood of thinking in other interactions of moving mass and momentum transfers that don't always "think" right, but exist none-the-less! Watch the interactions to see how "magic" interactions are possible with plain old matter properties (in this universe anyway!).

The bar (red for energy indicator) at a 90 degree angle to the stationary bar (in one time incarnation) when striking the blue bar does not transfer it's entire energy load into it, since it's a "glancing" blow, and by turning about it's own center, retains nearly half of it's initial relative momentum, while, well....., just watch it!

Another gif animation I cobbled together shows another interesting momentum transfer, this one being "sticky", a way to transfer momentum and not bounce or "react" with the transfer in a linear motion sense. Interesting Huh? This one doesn't seem reversible, however, Hmmmmmmmmm.

What do these have to do with the GIT? Uh, well.....I rendered them to see the stuff in my head a bit more clearly, and they dress up my website with only a

couple of bytes!

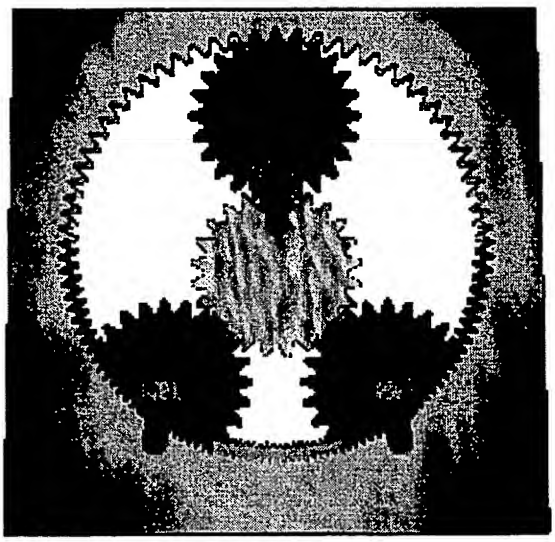
Other than that, the angular transfers of relative motion are of great concern in this device.

Starting with ZERO thrust of a variable velocity type of inertial thruster attempt, we look at what we have in that zero, and it's a tug of war that stays balanced (through time) over the mud pit, no one wins!

SO, how about tilting the odds in the favor of one team, taking out a swath of the foot hold of the loosing side? WE can DO that!

With orbitals that can increase and decrease their spin rate, we now have somewhere to put some of one side of the momentum tug of war! While the acceleration energy does in fact react with the race to slow it down (transfered into the race as a thrust wanting to hold you back), in my device, now the spin axis of the orbital shares some of that reverse thrust!

A good portion of that reverse vector is turned head over tail by the orbital as an increase in spin rate, thus removing some of the reverse force from the center of mass of your total system.



The orbitals are included in your system mass (centroid), but the energy needed to accelerate (in a linear sense) a spinning orbital is darn near equal to that needed to push along a non-spinning one!

Our orbital can gulp up and regurgitate momentum and not get heavier against the race! A bolemic orbital! (uh, ... sorry!)

The race does not absorb the total energy of the decelerating orbital, so the now stronger centrifugal force profile can win our tug of war!

Upon reaching the tail of our race, the orbital has now two momentum components, it's increased spin momentum, and reduced forward momentum.

On it's way back to the nose, the orbital powers itself against the race to accelerate it (relative to the race), however, since the decreasing spin is winding out to accelerate the orbital, now it only needs to accelerate one side, since half of the mass is already traveling in the direction you want it to go, less energy of position (from the center of mass of the system) is needed to motivate it forward in the race.

In one complete orbit, we have three inertial profiles to examine. The centrifugal force profile is easily found by the known race velocity (squared) times it's mass, divided by the radius. That will be constant regardless of orbital spin rate.

The centrifugal profile of, say a two to one difference in nose and tail velocity, is 4 times what it is at the tail. If the difference is 10 (Nose/tail velocity), then the centrifugal force at the nose is 100 times!

There is less total difference than supposed by the last statement, of the actual forces over time, the longer dwell time of the orbital at the tail does cut down the dramatic gain of the centrifugal force, but

still, it IS an unbalanced centrifugal force (race velocity SQUARES the radial force, time only adds linearly to the thrust at the reverse positions).

The acceleration and deceleration of the orbital about the race is rather easy too. This is the force that previously held you back, and one more component is factored with that, and that is the spin accelerations.

The energy has to come from somewhere (literally a vectored thrust of magnitude), and both experience, and theory, has that spin thrust coming from the back directed tangential forces.

By having the orbital spin, we now have another dimension in which to store for a convenient time (and direction), part of one side of the tug of war, and now the impossible is not only possible, it's been repeated many times around the world!

Now here is the question. What are we trading for energy of position in space without an outside mass exchange? Is it time? Is it a dimensional "folding" of space on one side and unfolding, (unwinding actually) on the other that makes it operate?

That's over MY head! It works, Whaaat!, you need to know WHY? Me TOO actually, and I've kicked around many ideas, yet I have enough traditional science under my lid that it's difficult to think along "heretical" lines, so I fully understand the difficulty of those well schooled in the physical sciences have in looking into my (and others) claims.

So DISprove it! As long as the spin accelerations are accounted for, (from what vector do they enter and leave the orbital from the race), and an honest attempt is made, I'm confident eyes will open, though opening minds may take a little longer.

Consider this my personal invite to you, to join a growing number of visionaries that want to see the CHEAP SPACE FLIGHT ERA begin as SOON AS POSSIBLE! Many have attempted the math, and those that "don't need to figure in the spin, since we're only considering the interaction of the one mass on the frame", are disqualified by their own words. We need to account for the momentum wrapped around the orbital.

Those that show unidirectional thrust from a sum of the centrifugal and the tangential (energy and vectors needed to slow down and speed up the orbitals) only, are VERY suspect, as those sums should be as close to Zero as your error factor allows, and those that ONLY consider the spin interactions, assuming an initial zero sum for centrifugal and tangential, are a few bricks short of a proof.

I am aware of proofs that haven't reached me yet, and there must be treatments done that I will likely never see from the research labs about the world, but the first to do a good analysis that I recognize as sound (and have checked of course) will likely go into history as the first to do so, AND likely get a lot of job offers shortly thereafter!

The challenge is still unanswered, none have made the finals to date (5 January '98 at this writing), surely in the thousands who read my site there is one so bold as to prove that inertial propulsion by this means is real? Write to me, I'll be happy to assist with whatever further info I can give.

At this writing I am in the process of animating a 5 to one race with gears to derive particulars for a standardized problem, and anotated graphics of the movement and spin particulars, will be posted (soon I hope, been rather busy with mail these days!).

This document will change occasionally to reflect better analogies, more "bite sized" graphic animations to better visualize the parts in action, and even if I just feel like it! Check this document for future updates.

^

Comments, suggestions, gossip, your analysis of the device, etc. is welcome.

Of course I will accept major contributions! ,'8~)

Don't *even* offer to buy stock or shares, as I will not be obliged to make you money, and have any future decision, such as a release to public domain compromised.

Assignment of rights or agreement with a company that can do justice to the massive applications these inventions (and improvements not published) entail, will be considered.

Before Copying and distributing these documents, please read GITLEGAL.

I hereby declare that the contained original information is true and correct to the best of my knowledge and ability to extrapolate.

5 January 1998 David Eugene Cowlishaw

1 February 1998 Link to Roger Cook's site corrected
8 April "circumferal" changed to tangential (folks didn't like my new word!)~8

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